

PREVALENCE OF PRESSURE INJURIES AND RELATED FACTORS IN CLINICAL PATIENTS AT A UNIVERSITY HOSPITAL

PREVALÊNCIA DE LESÃO POR PRESSÃO E FATORES RELACIONADOS EM PACIENTES CLÍNICOS DE UM HOSPITAL UNIVERSITÁRIO

PREVALENCIA DE LESIONES POR PRESIÓN Y FACTORES RELACIONADOS EN PACIENTES CLÍNICOS DE UN HOSPITAL UNIVERSITARIO

¹Jaqueline Aparecida dos Santos Sokem

²Mariana Camilo Pedroso Maia

³Jaine da Silva Belaver

⁴Alice Milani Nespollo

⁵Larissa Bessani Hidalgo Gimenez

⁶Fabiana Perez Rodrigues Bergamaschi

¹Enfermeira. Docente do Instituto de Ciências da Saúde da Universidade Federal de Mato Grosso. Sinop-MT, Brazil. Orcid: <https://orcid.org/0000-0001-8075-0829>.

²Enfermeira. Egressa do Curso de Enfermagem da Universidade Federal de Mato Grosso. Sinop-MT, Brazil. Orcid: 0009-0007-8868-1398

³Enfermeira. Egressa do Curso de Enfermagem da Universidade Federal de Mato Grosso. Sinop-MT, Brazil. Orcid: <https://orcid.org/0009-0004-4046-3875>

⁴Enfermeira. Docente do Instituto de Ciências da Saúde da Universidade Federal de Mato Grosso. Sinop-MT, Brazil. Orcid: <https://orcid.org/0000-0003-1307-0350>

⁵Enfermeira. Docente do Instituto de Ciências da Saúde da Universidade Federal de Mato Grosso. Sinop-MT, Brazil. Orcid: <https://orcid.org/0000-0002-3262-0023>

⁶Enfermeira. Docente da Universidade Estadual de Mato Grosso do Sul, Campo Grande-MS, Brazil. Orcid: <https://orcid.org/0000-0003-1820-1196>.

Corresponding Author

Jaqueline Aparecida dos Santos Sokem

Rua Projetada 1, n. 864. Bairro Bunitis.

Sinop-MT. Brazil. CEP 78559-373. phone:

+55 (67)99280-3236. E-mail:

jaqueline_skm@hotmail.com

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ABSTRACT

Introduction: Pressure injuries represent a serious challenge for healthcare services; their occurrence can worsen a patient's clinical condition, leading to prolonged hospital stays and increased healthcare costs. **Objective:** To determine the point prevalence of pressure injuries among clinical patients at a university hospital. **Method:** This is a cross-sectional, descriptive, and exploratory study using a quantitative approach and a convenience sample. The data collection took place on four separate dates between August and November 2021. The data were then tabulated and analyzed using the statistical software Jamovi (version 2.3.28 solid). A descriptive statistical analysis was performed, including the calculation of means and standard deviations for categorical variables, as well, it was identified the correlation between qualitative variables using Fisher's exact test and the χ^2 test. **Results:** A total of 56 patients have participated of the study; the mean age was 53.7 years, and the majority were male (60.7%). Half (50%) of the patients were at high risk of developing such injuries. The point prevalence was 23.2%. Regarding the wound classification, 19.1% were at stage 3 injuries. **Conclusion:** The observed prevalence is similar to findings from previous studies; however, the identified injuries were at an advanced stage. Inconsistencies were noted in medical records regarding to wound dressing procedures and clinical documentation. These findings highlight the need for educational and training initiatives for healthcare professionals, concerning to prevention, treatment, and documentation of pressure injuries, aiming to improve the quality of care and clinical practice.

Keywords: Pressure Ulcer; Cross-Sectional Studies; Prevalence; Stomatherapy.

RESUMO

Introdução: A lesão por pressão é um sério agravo para os serviços de saúde e sua ocorrência pode agravar o quadro do paciente, resultando em tempo de hospitalização prolongado e aumento dos custos destes serviços. **Objetivo:** Verificar a prevalência pontual de lesão por pressão em pacientes clínicos de um hospital universitário. **Método:** Trata-se de um estudo transversal, descritivo e exploratório, de abordagem quantitativa e amostra por conveniência. A coleta de dados ocorreu em quatro datas, entre os meses de agosto a novembro de 2021. Após, os dados foram tabulados e analisados através do programa estatístico Jamovi versão 2.3.28 solid. Foi realizado análise estatística descritiva, com cálculos de média e desvio padrão para as variáveis categóricas, bem como, foi identificado a correlação entre as variáveis qualitativas, através dos testes exato de Fisher e teste χ^2 . **Resultados:** participaram do estudo 56 pacientes; a idade média foi de 53,7 anos, o sexo masculino foi o mais frequente (60,7%); 50% dos pacientes apresentavam risco alto de desenvolver esta lesão. A prevalência pontual foi de 23,2%. Com relação à classificação das feridas, 19,1% eram de estágio 3. **Conclusão:** a prevalência encontrada está semelhante a estudos já realizados, todavia, o estágio das lesões identificadas é avançado. Verificou-se inconsistências nos prontuários, com relação às condutas dos curativos e anotações. Estes achados, denotam a importância de ações educativas e formativas para os profissionais de saúde sobre prevenção, tratamento e registros acerca do tema, de maneira a qualificar a assistência e as práticas de cuidado.

Palavras-chave: Úlcera por Pressão; Estudos Transversais; Prevalência; Estomaterapia.

RESUMEN

Introducción: Las lesiones por presión representan un desafío importante para los servicios de salud; su aparición puede empeorar el estado clínico del paciente, lo que conlleva a estancias hospitalarias prolongadas y un aumento en los costos de atención sanitaria. **Objetivo:** Determinar la prevalencia puntual de lesiones por presión en pacientes hospitalizados en un hospital universitario. **Método:** Se trata de un estudio transversal, descriptivo y exploratorio, con un enfoque cuantitativo y una muestra por conveniencia. La recolección de datos se llevó a cabo en cuatro fechas distintas entre agosto y noviembre de 2021. Los datos fueron tabulados y analizados mediante el software estadístico Jamovi (versión 2.3.28 solid). Se realizó un análisis estadístico descriptivo, que incluyó el cálculo de medias y desviaciones estándar; asimismo, se examinó la correlación entre las variables cualitativas utilizando la prueba exacta de Fisher y la prueba χ^2 . **Resultados:** Un total de 56 pacientes participaron en el estudio; la edad media fue de 53,7 años y la mayoría eran hombres (60,7 %). La mitad (50 %) de los pacientes presentaba un riesgo elevado de desarrollar este tipo de lesiones. La prevalencia puntual fue del 23,2 % en cuanto la clasificación de las lesiones, el 19,1 % correspondía a lesiones de estadio 3. **Conclusión:** La prevalencia observada es similar a la hallada en estudios previos; no obstante, las lesiones identificadas se encontraban en un estadio avanzado. Se detectaron inconsistencias en los registros clínicos en relación con los procedimientos de curación de heridas y la documentación clínica. Estos hallazgos subrayan la necesidad de implementar iniciativas de educación y capacitación para los profesionales de la salud en torno a la prevención, el tratamiento y la documentación de las lesiones por presión, con el fin de mejorar la calidad de la atención y la práctica clínica.

Palabras clave: Úlcera por Presión; Estudios Transversales; Prevalencia; Estomaterapia.

INTRODUCTION

A pressure injury (PI), formerly referred as a pressure ulcer (PU), is defined as a localized damage to the skin and/or underlying soft tissue, occurring as a result of an unrelieved pressure on the skin, which can, may or may not be associated to a shear occurrence. Such injuries typically affect areas over bony prominences or are associated with the use of medical devices and/or other healthcare-related equipment⁽¹⁾.

According to the National Pressure Ulcer Advisory Panel (NPIAP), these injuries result from intense and/or prolonged pressure on the skin or tissues, or a combination of pressure and shear. They may manifest either as erythema on intact skin or as an open ulcer, often accompanied by pain⁽²⁾.

These injuries are common in patients with neurological impairment, including reduced levels of consciousness, diminished sensory perception, or limited activity and mobility, who are therefore highly dependent on a nursing team or, in the case of home care, by caregivers for self-care and the prevention of skin damage. Beyond these factors, other elements can be associated with the development of such wounds, including the use of vasoactive drugs, nutritional imbalances, anemia, infections, tissue tolerance, incontinence, hemodynamic instability, agitation, exposure of the skin to moisture, extremes of age, and the presence of comorbidities⁽¹⁾.

Pressure injuries represent a serious public health issue, negatively affecting patients' quality of life and significantly increasing costs for healthcare systems⁽³⁾. Understanding their

causes, prevention, and treatment is essential for reducing the incidence and prevalence of these conditions, as well as for improving patient safety and well-being, particularly in hospital and long-term care settings⁽¹⁾. A study found that among patients in intermediate and semi-intensive care units, this type of skin lesion is frequent, occurring in 9.3% of patients and affecting primarily females (61.9%)⁽⁴⁾. Another study, which aimed to measure the prevalence of pressure injuries (PI) among hospitalized patients across three university hospitals, reported an annual prevalence of 10.1%⁽⁵⁾.

In Brazil, in 2013, the Ministry of Health established the National Patient Safety Program (PNSP) through the Ordinance GM No. 529. The primary objective of the PNSP is to improve the quality of healthcare in all facilities throughout the country⁽⁶⁾. Under this program, six patient safety goals were established. These goals include: to promote an institutional culture focused on adherence to hands hygiene to reduce infection rates; to improve communication among healthcare professionals; to promote and ensure safe surgeries to be performed on the correct patients; correctly identifying patients; to ensure the safe prescription, administration, and use of medications; and to prevent falls and pressure injuries⁽⁶⁻⁷⁾.

In conjunction with this program, protocols were developed for each of the related areas/topics to enhance the quality of healthcare in Brazil and spread the culture of patients' safety. These documents serve as guidelines, designed to promote safe practices and prevent

errors which could compromise patient health during care; they are essential for the practice of nursing professionals⁽⁶⁻⁷⁾.

It should be noted that pressure injuries, when present in advanced stages (stages 3 and 4), are considered serious healthcare-related adverse events⁽⁷⁾. Thus, it is necessary to understand the magnitude of this problem within the local context of each institution, in order to identify weaknesses in the care provided by the staff and, consequently, pinpoint critical areas that require intervention to improve care practices⁽¹⁾.

This study, therefore, aims to determine the point prevalence of pressure injuries and related factors among clinical patients, admitted to a university hospital. The investigation seeks to identify the frequency of these injuries, as well as the associated risk factors, thereby contributing to the development of effective future preventive and management strategies. This analysis is essential for improving the quality of care and reducing complications resulting from pressure injuries, which can negatively impact the length of hospital stay, healthcare costs, and patients' life quality^(1,8).

METHODS

This is a cross-sectional, point-prevalence, observational, and descriptive study, employing a quantitative approach to data analysis. The study was conducted at the University Hospital of the Federal University of Grande Dourados, located in the municipality of Dourados, Mato Grosso do Sul state, Brazil. It is one of the largest hospital institutions in the state, providing care to all

patients through the Unified Health System (SUS).

One of the institution's units is the Internal Medicine Nursery. There are 34 general beds and 2 beds for patients requiring respiratory isolation in this unit. It was selected for this research because it houses adult patients, many of them have been transferred from the intensive care unit (ICU) to continue their treatment. Furthermore, many patients admitted to the Internal Medicine Nursery experience reduced mobility and sensory perception, as well as a lowered level of consciousness, making them susceptible to the development of pressure injuries⁽⁷⁾.

The data were collected between August and November 2021, on four separate dates, one in each of these months. This approach was chosen to provide a more accurate snapshot of the point prevalence within this specific unit, in accordance with the current technical note issued by Anvisa⁽⁷⁾.

The study population consisted of all patients admitted to the hospital's medical clinic on the dates designated for the data collection. A non-probabilistic convenience sample was used.

Inclusion criteria: patients aged 18 years or older, admitted to the medical clinic for at least 24 hours, and identified as being at risk for developing pressure injuries. Exclusion criteria: Indigenous patients, due to current Brazilian legislation which requires that studies involving this population must be reviewed by the National Research Ethics Commission (CONEP), a process which did not happen for this study.

Both, primary and secondary data, were used in this research. Primary data were obtained directly through the study, including sociodemographic information and data which were gathered during physical examinations of the patients. Secondary data were collected from patient medical records to identify the medical diagnosis which prompted the admission, underlying health conditions, clinical notes, and scores on the Braden Scale.

The physical examination was conducted by a nurse, specialized in enterostomal therapy, who, at the time of the study, served as a staff nurse at the institution and as the chair of the Skin Care Committee. During the physical examination, the patients' skin was carefully assessed to identify cutaneous or temperature changes, non-blanchable erythema, edema, and other potential alterations, both over bony prominences and in areas in contact with medical devices.

The pressure injuries identified, were classified according to the NPIAP classification system^(2,9). The data collection procedures employed, were similar to those used in a previous study with the same objective⁽¹⁰⁾.

Information regarding the patients' risk for pressure injuries, based on the Braden Scale, were also retrieved from their medical records. The Braden Scale is a predictive tool for the development of pressure injuries; it was originally developed and validated in English language⁽¹¹⁾ and subsequently translated and validated for use in Portuguese language⁽¹²⁾. The Braden Scale for adults consists of six subscales

(sensory perception, moisture, mobility, activity, nutrition, and friction/shear), which are relate to a patient's risk factors for developing pressure injuries. When assessed using this tool, a patient can receive a score ranging from 1 to 4 for each subscale, excepting of the friction/shear subscale, which has a maximum score of 3. The total score on the scale can range from a minimum of 6 to a maximum of 23 points⁽¹²⁾.

The data were organized and entered using a double-entry method into an Excel® spreadsheet, and subsequently imported into the statistical software Jamovi® (version 2.3.28 solid).

Categorical variables were presented using descriptive statistics, yet for quantitative variables, the mean and standard deviation were calculated. Data normality were assessed using the Kolmogorov-Smirnov test⁽¹³⁾.

Statistical tests were performed to identify correlations between the variables. Given that most of the variables were qualitative, either Fisher's exact test or the χ^2 test were applied, depending on the observed frequencies⁽¹³⁾. A significance level of 5% was adopted⁽¹⁴⁾.

To calculate the prevalence of pressure injuries, epidemiological concepts were applied to determine the occurrence of this condition among patients at risk. When analyzing prevalence rates, it is recommended that studies define the condition of interest using the population at risk as the denominator⁽¹⁵⁾. Therefore, the following formula was used: the number of patients with a pressure injury divided

by the population at risk of developing a pressure injury at the time of data collection⁽⁷⁾.

This study was adhered to ethical principles; the data were collected only after the research was explained to the participants, or their legal guardians, and they had provided their consent by signing the Informed Consent Form (ICF). The study was also approved by the institutional Research Commission and the Research Ethics Committee of the Federal University of the Grande Dourados (UFGD) (according to the report no. 3.899.596).

RESULTS

The total population of hospitalized patients across the four data collection dates was 103 individuals. However, given that the study's objective was to assess the prevalence, specifically among the population at risk of

developing pressure injuries, in accordance with Anvisa's recommendations, 56 of the hospitalized patients (54.3%) were identified as being at risk for such injuries; this group constituted the total number of study participants⁽⁷⁾.

The mean age of the participants (N=56) was 53.7 years (SD±18.3), with 34 male patients (60.7%) and 22 (39.3%) female patients. The study also sought to identify the medical conditions which led the participants to hospitalization. The most frequent pathologies included chronic kidney disease, pulmonary tuberculosis, pneumonia, and infection by the novel coronavirus (COVID-19). These data are presented below.

Table 1 - Medical diagnosis related to hospitalization and underlying diseases of the study participants , Sinop-MT, Brazil – 2025 (N=56).

Medical diagnosis which prompted to hospitalization	Frequency n (%)
COVID-19 virus infection	8 (14,3)
Pulmonary tuberculosis	6 (10,7)
Chronic kidney disease	5 (8,9)
Pneumonia	5 (8,9)
Neurotoxoplasmosis	4 (7,0)
Liver cirrhosis	3 (5,4)
ITP (Immune thrombocytopenic purpura)	3 (5,4)
Osteomyelitis	2 (3,6)
Lower urinary tract infection	2 (3,6)
Guillain-Barré syndrome	2 (3,6)
Isolated encephalopathy	2 (3,6)
Total of other conditions with a frequency of less than one case	14 (25,0)
Underlying diseases	Frequency n (%)
Hypertension (HTN)	11 (19,6)
HTN and diabetes mellitus (DM) concurrently	10 (17,8)
Acquired immunodeficiency syndrome (AIDS)	11 (19,6)
Diabetes mellitus (DM)	8 (14,3)
Paraplegia	2 (3,6)
Liver cirrhosis	2 (3,6)
COPD	2 (3,6)
Pulmonary tuberculosis	2 (3,6)
Total of other conditions with a frequency of less than one case	8 (14,3)

Source: Research data (2025).

Given the complexity of patients admitted to the medical clinic, as well as the demands placed on nursing staff and the care required, an assessment was conducted regarding the types of medical devices present, the types of venous access used, and the use of supplemental oxygen among the participants.

An association test was performed between the variables to examine the occurrence

of pressure injuries (PIs) and their potential link to the type of diet, the use of medical devices, or the administration of supplemental oxygen. A statistically significant relationship was found between the presence of PIs and the use of supplemental oxygen, as well as between the occurrence of PIs and both enteral and oral diets. These findings are presented in the following Table 2.

Table 2 - Medical devices, types of venous access, use of supplemental oxygen, and types of diet among study participants. Sinop-MT, Brazil – 2025 (N=56).

Type of venous acces	With LP n (%)	Without LP n (%)	Total n (%)	Value-p
Peripheral venous acces	13 (25,5)	38 (74,5)	51 (100,0)	0,198
Central venous acces	1 (12,5)	7 (87,5)	8 (100,0)	0,665
Use of urinary catheter				
Long term urinary catheter	2 (50,0)	2 (50,0)	4 (100,0)	0,076
Cystostomy	1 (100,0)	0 (0,0)	1 (100,0)	0,232
Intermittent urinary catheter	0 (0,0)	1 (100,0)	1 (100,0)	1,00
Use of supplemental oxygen				
Supplemental oxygen	7 (53,8)	6 (46,2)	13 (100,0)	0,025*
Diapers				
Use of diapers	12 (26,1)	34 (73,9)	46 (100,0)	0,275
Type of diet				
Oral diet	6 (14,0)	37 (86,0)	43 (100,0)	0,003*
Enteral tube diet	6 (50,0)	6 (50,0)	12 (100,0)	0,008*
Gastrostomy diet	1 (100,0)	0 (0,0)	1 (100,0)	0,232

Source: research data (2025). *The p-value was obtained using Fisher's exact test for the variables: use of central venous access, use of a urinary catheter, and gastrostomy-based nutrition. For the variables: use of peripheral venous access, use of supplemental oxygen, use of diapers, oral nutrition, and enteral tube feeding, the p-value was obtained using the χ^2 test; the significance level was set at <0.05 .

Regarding to the primary objective of this research, to determine the prevalence of pressure injuries among the patients, a rate of 23.2% was observed. In addition to the occurrence of this condition, the study also categorized the identified injuries. In this research, 13 patients

presented with pressure injuries (PIs); the most frequent were stage 3 PIs, followed by stage 4 PIs and deep tissue injuries. Consequently, it is evident that all the identified injuries constitute serious adverse events⁽⁷⁾. These data are presented in the following table.

Table 3 - Point prevalence of pressure injuries and information derived from the identified injuries. Sinop-MT, Brazil – 2025 (N=56).

Information related to the identified pression injures	F	%
PI presence		
Yes	13	23,2
No	43	76,8
Classification of the injures found		
Stage 3	11	19,7

Stage 4	1	1,8
Deep tissue PI	1	1,8
Without PI	43	76,8
Number of PI identified per patient		
One PI	9	16,1
Two PIs	4	7,1
No PIs	43	76,8
Body location of PIs		
Sacral	6	10,7
Sacral and calcaneal, concurrently	3	5,4
Gluteal	2	3,6
Right and left trochanters	1	1,8
Calcaneal	1	1,8
No PIs	43	76,8
Products prescribed for the treatment of PIs		
Papaina	5	8,9
Hidrogel	3	5,4
Collagenase	1	1,8
Hydrocolloid dressing	1	1,8
Hydrogel combined with a polyhexamethylene biguanide (PHMB) solution	1	1,8
No formal treatment prescribed	2	3,6
No PIs	43	76,8
Site of lesion appearance		
Unit-acquired PI	4	7,1
Community-acquired PI	5	8,9
PI acquired in another department of the institution	4	7,1
No PIs	43	76,8

Source: research data (2025). Legend: N = total number of patients at risk for pressure injury; f = total number of patients presenting a pressure injury or characteristics of a pressure injury.

An attempt was made to establish an association between the scores obtained on the Braden Scale and the participants' age; however, no statistically significant correlation was found between these variables. Spearman's correlation

test was used for this analysis. The following table describes the classification based on Braden Scale scores and the correlation between this classification and the presence of pressure injuries (PI).

Table 4 - Classification of participants according to their risk of pressure injury, and the correlation with the presence of such injury. Sinop-MT, Brazil – 2025 (N=56).

Classification on Braden scale	With PI n (%)	Without PI n (%)	Total n (%)	Value-p
Low	2 (7,1)	26 (92,9)	28 (100,0)	0,01*
Moderated	3 (23,1)	10 (76,9)	13 (100,0)	1,00
High	7 (50,0)	7 (50,0)	14 (100,0)	0,006*
Very high	1 (100,0)	0 (0,0)	1 (100,0)	0,232

Source: research data (2025). For the variable "high score on the Braden scale," the p-value was obtained using the χ^2 test. For the remaining variables, the p-value was obtained using Fisher's exact test; the significance level was set at <0.05 .

DISCUSSION

In this study, the mean age of patients at risk for or already presenting pressure injuries was 53 years. Another similar study found a mean patient age of 60 years⁽¹⁶⁾. A different study, also aimed at identifying the prevalence of

pressure injuries, reported a mean age of 58.5 years⁽¹⁷⁾.

Regarding sex, it was observed that the majority of hospitalized patients at risk for pressure injuries were male (60.7%). Similarly, another study found that male patients were the

most affected by pressure injuries (64.1%)⁽¹⁸⁾. Another research, which sought to identify the prevalence of pressure injuries among patients admitted to intensive care units, also found that the majority of hospitalized patients were male (54.47%)⁽¹⁶⁾.

In the present study, the primary conditions leading to hospitalization were COVID-19 infection (14.3%), pulmonary tuberculosis (10.7%), chronic kidney disease (8.9%), pneumonia (8.9%), and neurotoxoplasmosis (7.0%). These findings highlight the significance of infectious and chronic diseases in patient hospitalizations. By comparison, another study which evaluated the prevalence of pressure injuries, indicated a predominance of respiratory system-related conditions (30.74%), followed by cardiac disorders (10.78%)⁽¹⁷⁾.

In this study, systemic arterial hypertension and diabetes mellitus were observed to be the most frequent comorbidities among patients at risk for pressure injuries. Another common condition identified in this research was the acquired immunodeficiency syndrome (19.6%). A study aimed at determining the prevalence of a different group of skin lesions, also in patients in medical clinics, found that the primary comorbidities among these patients were hypertension (85.8%) and diabetes mellitus type II (57.2%)⁽¹⁹⁾. Another study, conducted in Brazil, identified cardiovascular diseases, followed by respiratory diseases, as the most common conditions among patients admitted to critical care units⁽²⁰⁾.

Regarding to the primary objective of this study, which was to determine the point prevalence of pressure injuries among patients admitted to a medical clinic, a 23.2% prevalence of pressure injuries was observed across the four data collection dates.

At the international scenery, a multicenter study analyzed the point prevalence of pressure injuries, based on a single day of data collection, across 86 different intensive care units (ICUs) in France, identifying a rate of 18.7%⁽²¹⁾. Similarly, another multicenter study, conducted in 1,117 ICUs across various countries, reported a prevalence of 16.2%⁽¹⁸⁾.

A study on the prevalence and incidence of pressure injuries, conducted in the medical clinic of a public university hospital in the state of Paraíba, Brazil, found a point prevalence of 21.2%⁽²²⁾.

Another national study, involving critically ill patients, found a point prevalence of 46.34% for pressure injuries⁽¹⁶⁾. A study that examined the incidence of various skin lesions in critically ill patients, found that 19.2% of the patients developed pressure injuries, while 36.3% developed incontinence-associated dermatitis, a finding that highlights the high occurrence of such lesions among hospitalized patients⁽²³⁾. One of the most frequent consequences of a prolonged hospital stay is the development of skin alterations. Several factors are associated to an increased risk of developing pressure injuries (PIs), including systemic arterial hypertension, diabetes, altered levels of consciousness, immobility, loss of motor and sensory function,

urinary and fecal incontinence, muscle spasms, nutritional deficiencies, anemia, high or very low body mass index, circulatory diseases, peripheral artery disease, immunodeficiency, the use of corticosteroids, and smoking. These factors highlight the need for a careful, multidisciplinary approach to the prevention and management of PIs⁽¹⁾.

Pressure injuries (PIs) frequently occur in areas of the body subject to greater pressure and friction, and the sacral region is a very common site⁽²⁴⁾. In this study, the sacral region was the most affected body area, accounting for 10.7% of PIs. A similar study, conducted among patients admitted to both intensive care units (ICUs) and general medical clinics, found that the sacral region was the most frequent site for such injuries in both, ICU patients (20.9%) and the ones in the general medical clinics (33.4%). Another common site for these injuries is the heel (calcaneal region), which was identified as the location for PIs in 22.9% of patients⁽²⁵⁾.

Regarding to staging, the majority of PIs in this study were classified as stage 3, affecting 19.7% of the patients. Stage 4 PIs (1.8%) and deep tissue pressure injuries (1.8%) were also observed. A study on PI prevalence conducted in Pernambuco state, reported that stage 2 was the most frequent, accounting for 21.7% of cases⁽²⁴⁾. Furthermore, in the present study, regarding the number of injuries per patient, it was observed that 9 patients had a single PI (16.1%), while 4 patients had two PIs (7.1%).

Another Brazilian study, which aimed to determine the prevalence of PIs in ICU patients,

found that among the 57 identified injuries, 11 were stage 1; 13 were stage 2; 10 were stage 3; 5 were stage 4; six were unclassifiable; and 12 were deep tissue pressure injuries⁽¹⁶⁾.

A study conducted in Brazil involving elderly patients admitted to a general medical clinic, found that 33.3% of the PIs were stage 1; 57.1% were stage 2, and 9.5% were stage 3⁽²⁶⁾. Thus, it can be concluded, on the contrary to the findings of this study, that pressure injuries (PIs) frequently observed in other research and institutions are typically stage 1 or stage 2; that is, they represent more superficial stages of the injury and are not classified as serious adverse events⁽⁷⁾.

In addition to what are considered classic pressure injuries, which affect areas over bony prominences, there are medical device-related pressure injuries (MDRPIs). Medical devices play a significant role in the development of PIs, particularly in cases of prolonged contact with items such as tubes, catheters, oxygen masks, and immobilizers⁽¹⁾. Although this study did not identify any MDRPIs within the sample, it was noted that patients were using various types of devices or therapies as part of their care: 53.8% were receiving supplemental oxygen, and 50% were receiving enteral nutrition. No patients were receiving parenteral nutrition.

A study on the prevalence of PIs, conducted in France, found that 51.7% of patients received oral nutrition, 33.5% received enteral nutrition, and 14.8% received parenteral nutrition. Through logistic regression, it was determined that the use of enteral or parenteral

nutrition was an independent factor directly associated with the occurrence of PIs⁽²¹⁾.

All identified lesions were in advanced stages and classified as serious healthcare-associated adverse events. Such lesions, point to failures in prevention and proper management, potentially leading to complications including infections, pain, and prolonged hospital stays. Pressure injuries (PIs) that result in significant harm to a patient's health, specifically those in advanced stages (stages 3 and 4), are categorized as serious adverse events. These PIs can lead to severe infections, such as sepsis and osteomyelitis, needing of surgical interventions, and extend the length of hospitalization. These wounds, often much times preventable, arise from a lack of preventive measures, such as inadequate patient mobilization, insufficient risk assessment, or the improper use of support surfaces. Consequently, the implementation of care protocols, continuous monitoring, and staff training are essential measures for reducing the occurrence of these events⁽⁷⁾.

Beyond the identification of advanced-stage lesions, it was examined the clinical management documented in nursing notes or medical prescriptions and orders. Shortcomings were observed regarding to wound care instructions and documentation; for instance, an antimicrobial dressing was used for only one patient, even though these PIs are complex, hard-to-heal wounds, often involving the presence of microorganisms and biofilms, which require broader and more individualized approaches⁽²⁷⁾.

Furthermore, hydrocolloid dressings were used in the treatment of these PIs. However, given that all the identified PIs were in advanced stages, most commonly in stage 3, this choice of dressing was inappropriate, as current guidelines recommend hydrocolloid dressings specifically for the treatment of stage 2 pressure injuries⁽¹⁾.

It should also be noted that in the institution where the study was conducted, it's standardized the use of polyhexamethylene biguanide (PHMB) solution for wound care. This is an effective antimicrobial agent which also acts against biofilms. However, this research revealed that it was used in only one instance of a pressure injury (PI), suggesting that it may lacks to healthcare professionals the knowledge regarding to the proper management of PIs and the products available at their institution. Such shortcomings in treatment, compromise patient's recovery and highlight the need for educational initiatives for the staff, as well as the adoption of formal protocols⁽²⁷⁻²⁸⁾.

During the assessment, it was observed that for two patients with existing PIs, there was no formal medical or nursing prescription for wound dressing procedures. Physical examination of the patients indicated that some type of dressing material, along with conventional gauze, had been applied. However, there was no record of which specific dressing product was used, neither in the nursing notes nor in the medical orders. The lack of formal documentation regarding wound care procedures leads to inconsistencies and gaps in the ongoing

treatment of PIs, potentially even contributing to microbial resistance^(28,29).

A previous study, conducted at the same institution, which aimed to determine the prevalence of another type of skin injury, friction-related skin injury, also identified inconsistencies in nursing documentation concerning to patient's skin care⁽¹⁹⁾. Another study, which sought to evaluate the quality of medical and nursing prescriptions and documentation for patients with wounds, found that 93.9% of the prescriptions were incomplete, with discrepancies, identified in 31.4% of the medical and nursing orders⁽²⁹⁾. Consequently, it is essential to reflect upon these findings.

It was observed that only one nursing report mentioned the use of a protective film on the margins of pressure injuries (PIs), highlighting a lack of standardization in treatment documentation. Protecting wound margins is of utmost importance to prevent the worsening of a lesion and to promote more effective healing. The margins are sensitive areas which are left unprotected, they can easily become compromised due to friction, excessive moisture, or contact with wound exudate⁽³⁰⁾.

Proper protection of these margins prevents from the development of perilesional dermatitis, which is an inflammatory condition that affects the skin surrounding a lesion, which is particularly common in patients with ulcers, wounds, or hard-to-heal lesions. Factors such as excessive moisture, the use of medical adhesives, and wound exudate (along with its components) can trigger this type of dermatitis. The effective

management involves protecting the skin around the lesion, avoiding the use of irritants, keeping the area clean and dry, and utilizing protective films⁽³⁰⁻³¹⁾.

The Braden Scale, which is widely used in Brazil and globally, identifies individual risk factors for the development of pressure injuries. It is an excellent predictive tool, with its use recommended even by government institutions⁽⁷⁾. Adopting a predictive scale allows nurses to plan appropriate care, tailored to a patient's specific needs and to implement preventive strategies to avoid PIs, an approach that can significantly reduce the prevalence of these conditions⁽³²⁾.

Among the patients in the study, the majority were at low risk for pressure injuries. Of those who already had a pressure injury, 50% were at high risk, and 23.1% were at moderate risk. An integrative review on the subject, revealed that 12.5% of patients had scores indicating a high to very high risk for pressure injuries (PI)⁽³²⁾. A Brazilian study indicated that the mean score on the Braden scale among patients with PIs was 11.45%⁽¹⁶⁾. Another study, conducted on critically ill patients, found that the majority had scores, classifying them as being at very high risk (10.9%) or high risk (29.6%) for developing PIs⁽¹⁸⁾.

The study's limitations include the fact that it was conducted at a single institution and within a specific unit. Furthermore, although the sample size exceeded to 50 patients, it could still be considered small, which can serve as another limitation. Future studies with larger samples and

multicenter approaches are recommended to enhance the validity of the findings.

CONCLUSIONS

This study, which aimed to determine the point prevalence of pressure injuries at four distinct time points, revealed a 23.2% prevalence rate among clinical patients. The mean age of the patients was 53.7 years, and the majority of the identified injuries were classified as stage 3, which corresponds to serious adverse events.

The findings of this study are significant: while the observed prevalence within this at-risk patient group is consistent with other published studies, however, the advanced stage of the identified pressure injuries indicates a substantial impact on the quality of care provided at the institution. Furthermore, the inconsistencies identified in medical records, in both, physician and nursing orders, highlight weaknesses on the continuity of care, and reinforce the need for educational and training initiatives for healthcare professionals, regarding to the prevention and treatment of pressure injuries, as well as the proper documentation of care, in order to improve the quality of assistance and clinical practice.

REFERENCES

1. National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Injury Alliance. Prevention and treatment of pressure ulcers/injuries: clinical practice guideline. The international guideline. Haesler E, editor. 4th ed. 2025. Available in: <https://internationalguideline.com>
2. Gefen A, Brienza DM, Cuddigan J, Haesler E, Kottner J. Our contemporary understanding of the aetiology of pressure ulcers/pressure injuries. *Int Wound J*. 2022 Mar;19(3):692-704. Available in: <https://doi.org/10.1111/iwj.13667>
3. Şengezer D, Erdoğan H. Knowledge and Attitudes of Operating Room Nurses Towards Pressure Injury Prevention: A Cross-Sectional Study. *Int Wound J*. 2026;23(1):e70827. Available in: <https://doi.org/10.1111/iwj.70827>
4. Soares LCB, Silva DO, Cunha JXP da, Pires P da S, Cardoso LGV. Desenvolvimento de lesão por pressão e complexidade assistencial em pacientes de um serviço de emergência. *Cogitare Enferm [Internet]*. 2022;27:e82550. Available in: <https://doi.org/10.5380/ce.v27i0.82550>
5. Silva LLO, Feliz LG, Negreiros RV, Abreu RA. Prevalência e incidência de lesão por pressão em pacientes internados em unidades de clínica médica. *Braz J Dev*. 2022;8(3):16138-49. Available in: <https://doi.org/10.34117/bjdv8n3-042>
6. Ministry of Health (BR). Portaria nº 529, from abril 1st 2013. Institui o Programa Nacional de Segurança do Paciente (PNSP). Brasília-DF: Ministry of Health; 2013 [citado 2023 Mar 29]. Available in: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2013/prt0529_01_04_2013.html
7. Ministry of Health (BR). Agência Nacional de Vigilância Sanitária. Technical note GVIMS/GGTES/Anvisa nº 05/2023: Práticas de segurança do paciente em serviços de saúde: prevenção de lesão por pressão. Brasília-DF: Anvisa; 2023 [noted 2025 Mar 05]. Available in: <https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/notas-tecnicas-vigentes/nota-tecnica-gvims-ggtes-anvisa-no-05-2023-praticas-de-seguranca-do-paciente-em-servicos-de-saude-prevencao-de-lesao-por-pressao/view>
8. Kurian S, Moore Z, Patton D, George S. The Incidence of Pressure Ulcers in Surgical Patients: A Systematic Review. *Int Wound J*. 2025;22(8):e70738. Available in: <https://doi.org/10.1111/iwj.70738>

9. Associação Brasileira de Estomaterapia; Associação Brasileira de Enfermagem em Dermatologia. Consenso NPUAP 2016 – Classificação das lesões por pressão adaptado culturalmente para o Brasil. São Paulo: SOBEST/SOBENDE; 2016 [noted 2025 mar 04]. Available in: https://sobest.com.br/wp-content/uploads/2020/10/CONSENSO-NPUAP-2016_traducao-SOBEST-SOBENDE.pdf
10. Matos LS, Duarte NLV, Minetto RC. Incidência e prevalência de úlcera por pressão no CTI de um Hospital Público do DF. *Rev Eletr Enferm.* 2010;12(4):719-26. Available in: <https://doi.org/10.5216/ree.v12i4.8481>
11. Bergstrom N, Braden B, Laguzza A. The Braden scale for predicting pressure sore risk. *Nurs Res.* 1987;36(4):205-10.
12. Paranhos WY, Santos VLCG. Avaliação de risco para úlceras de pressão por meio da Escala de Braden, Portuguese language translation. *Rev Esc Enferm USP.* 1999;33(esp):191-206.
13. Polit DF, Beck CT. Fundamentos da Pesquisa em Enfermagem: avaliação de evidências para a prática da Enfermagem. 9a ed. Porto Alegre, Brazil: Artmed; 2019.
14. Vrbic CM. Parametric or nonparametric statistical tests: Considerations when choosing the most appropriate option for your data. *Cytopathology.* 2022; 33: 663-667. Available in: <https://doi.org/10.1111/cyt.13174>
15. Bonita R, Beaglehole R, Kjellström T. *Epidemiologia Básica.* 2a ed. São Paulo: Santos Editora; 2010.
16. Souza TMP, et al. Lesão por pressão em pacientes críticos: prevalência e fatores associados. *Estima (Braz. J. Enterostomal Ther.).* 2024;22:e1519. Available in: https://doi.org/10.30886/estima.v22.1519_PT
17. Cavalcanti EO, Kamada I. Medical device-related pressure injury: frequency and associated factors. *Estima (Braz. J. Enterostomal Ther.).* 2022;20:e0322. Available in: https://doi.org/10.30886/ESTIMA.V20.1146_PT
18. Labeau SO, Afonso E, Benbenishty J, Blackwood B, Boulanger C, Brett SJ, et al. Prevalence, associated factors and outcomes of pressure injuries in adult intensive care unit patients: the DecuBICUs study. *Intensive Care Med.* 2021;47(2):160-69. Available in: <https://doi.org/10.1007/s00134-020-06234-9>
19. Sokem JAS, et al. Point prevalence of friction injury and associated factors in clinical patients. *Rev Enferm Atual Derme.* 2024;98(2):e024288. Available in: <https://doi.org/10.31011/reaid-2024-v.98-n.2-art.2088>
20. Teixeira AO, et al. Factors associated with the incidence of pressure wounds in critical patients: a cohort study. *Rev Bras Enferm.* 2022;75(6):e20210267. Available in: <https://doi.org/10.1590/0034-7167-2021-0267pt>
21. Jacq G, Legriel M, Chousterman B, Bouadma L, Valera S, Richard JC, et al. Prevalence of pressure injuries among critically ill patients and factors associated with their occurrence in the intensive care unit: the PRESSURE study. *Aust Crit Care.* 2021;34(5):411-18. Available in: <https://doi.org/10.1016/j.aucc.2020.12.001>
22. Silva LLO, et al. Prevalência e incidência de lesão por pressão em pacientes internados em unidades de clínica médica. *Braz J Dev.* 2022;8(3):16138-49. Available in: <https://doi.org/10.34117/bjdv8n3-042>
23. Monteiro DS, et al. Incidência de lesões de pele, risco e características clínicas de pacientes críticos. *Texto Contexto Enferm.* 2021;30:e20200125. Available in: <https://doi.org/10.1590/1980-265X-TCE-2020-0125>
24. Fecchio CA, Tanoue MK, Dias JR, Mansano VAN, Luz KCSI, Radovanovic CAT, et al. Lesão por pressão em adultos e idosos: revisão de escopo. *Cogitare Enferm [Internet].* 2024;29:e95368. Available in: <https://doi.org/10.1590/ce.v29i0.95368>
25. Fulbrook P, Miles S, Coyer F, Simpson T, Anderson J, Slattery P, et al. State-wide prevalence of pressure injury in intensive care versus acute general patients: A five-year

analysis. *J Clin Nurs.* 2023;32(15-16):4947-61. Available in: <https://doi.org/10.1111/jocn.16687>

26. Barbosa DSC, Faustino AM. Pressure injury in hospitalized elderly: prevalence, risk and association with functional capacity. *Enferm Foco.* 2021;12(5):1026-32. Available in: <https://doi.org/10.21675/2357-707X.2021.v12.n5.4689>

27. Kabir F, et al. Pressure injuries and biofilms: microbiome, model systems and therapies. *Wound Repair Regen.* 2025;33(1):1-11. Available in: <https://doi.org/10.1111/wrr.70005>

28. Swanson T, et al. IWII Wound Infection in Clinical Practice consensus document: 2022 update. *J Wound Care.* 2022;31(Sup12):S10-S21. Available in: <https://doi.org/10.12968/jowc.2022.31.Sup12.S10>

29. Lima BR, Silva GO, Galdino-Júnior H. Evaluation of nursing and medical prescriptions for dressings in a university hospital: ethical implications. *Enferm Foco.* 2020;11(5):67-72. Available in: <https://dx.doi.org/10.21675/2357-707X.2020.v11.n4.3334>

30. Forest-Lalande L, Parsons L, McPhee S, Kuhnke JL, Hoover J, Lillington T, et al. Best practice recommendations for the prevention and management of moisture-associated skin damage. In: Kuhnke JL, Burrows CA, Evans RM, Orsted HL, Rosenthal S, editors. *Best practice recommendations for skin health and wound management 2025.* Toronto (ON): Wounds Canada; 2025. Available in: <https://dx.doi.org/10.56885/JWRY3671>

31. Voegeli D, Hillery S. Prevention and management of moisture-associated skin damage. *Br J Nurs.* 2021;30(15):S40-S46. Available in: <https://dx.doi.org/10.12968/bjon.2021.30.15.S40>

32. Cavalcanti EO, Kamada I. Medical-device-related pressure injury on adults: an integrative review. *Texto Contexto Enferm.* 2020;29:e20180371. Available in: <https://doi.org/10.1590/1980-265X-TCE-2018-0371>

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Scientific Editor: Ítalo Araújo Pereira Ribeiro. ORCID: <https://orcid.org/0000-0003-0778-1447>